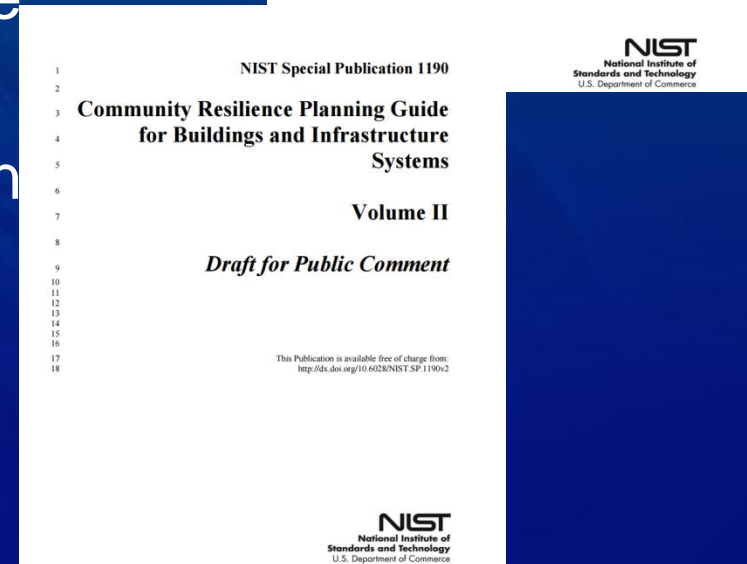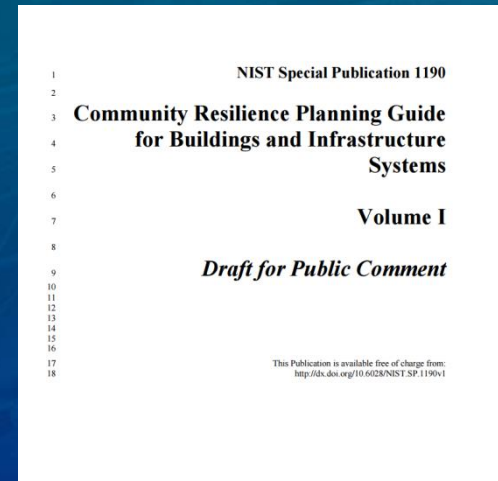# Draft Community Resilience Planning Guide – Informational Briefing

Purpose of This Briefing

- Build awareness of the draft NIST Community Resilience Planning Guide among key stakeholders.

- Invite comments so that we can improve the draft Guide and make it most useful for communities.

- Encourage use of the Guide when V1.0 is released in September.

NIST Special Publication 1190

Community Resilience Planning Guide for Buildings and Infrastructure Systems

Volume I

Draft for Public Comment

This Publication is available free of charge from:
http://dx.doi.org/10.6028/NIST.SP.1190v1

NIST National Institute of Standards and Technology
U.S. Department of Commerce

NIST Special Publication 1190

Community Resilience Planning Guide for Buildings and Infrastructure Systems

Volume II

Draft for Public Comment

This Publication is available free of charge from:
http://dx.doi.org/10.6028/NIST.SP.1190v2

NIST National Institute of Standards and Technology
U.S. Department of Commerce

Why Resilience Planning?

- All communities face potential disruption from natural, technological, and human-caused hazards.

- Disasters take a high toll in lives, livelihoods, and quality of life that can be reduced by better managing disaster risks.

- Planning and implementing *prioritized* measures can strengthen resilience and improve a community's ability to continue or restore vital services in a more timely way – and to build back *better*.

Why ResiliencePlanning? (Cont.)

- The built environment exists to serve a social function (e.g., a hospital provides healthcare). Therefore, social and economic needs and functions should drive the goals for performance of buildings and physical infrastructure.

- The draft NIST Community Resilience Planning Guide provides a *practical, flexible* methodology to better set priorities and allocate resources to reduce risks by improving their resilience.

Guide Development Process

Community Resilience Planning Guide Version 1.0 September 2015

February 2015 Workshop

San Diego, CA

- 75% Draft

April 2015 Workshop

Houston, TX

- Release Draft
- Public Comments until June 26

October 2014 Workshop

Norman, OK

- 50% Draft

July 2014 Workshop

Hoboken, NJ

- 25% Draft

April 2014 Workshop NIST

Planning Guide Overview

- The Guide helps communities:

  – Organize effectively to address resilience risks, goals, and priorities.

  – Determine customized long-term resilience goals.

  – Develop short- and long-term plans for buildings and infrastructure systems to achieve resilience goals.

  – Prioritize improvements to the built environment based on their role in supporting social institutions and economic functions during recovery.

  – Address infrastructure dependencies and cascading effects of system failures.

Planning Steps for Community Resilience

1. Form a collaborative planning team

2. Understand the situation

    – Social Dimensions

    – Built Environment

3. Determine goals and objectives

4. Plan development

5. Plan preparation, review, and approval

6. Plan implementation and maintenance
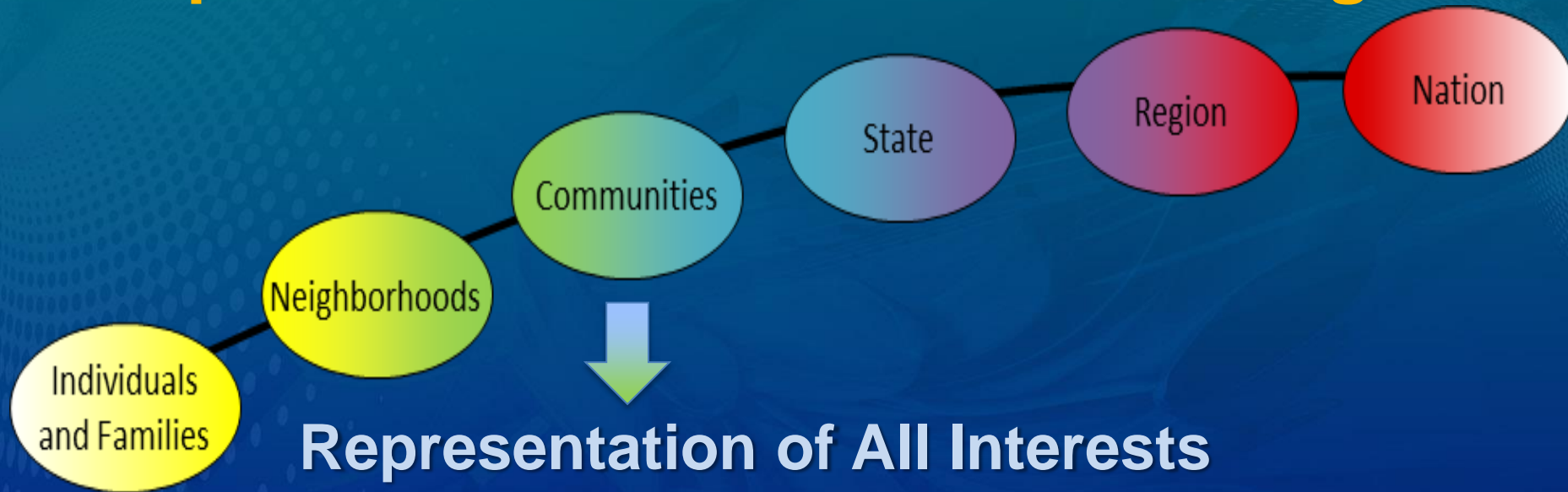

Downtown Cedar Rapids, Iowa, during the 2008 floods
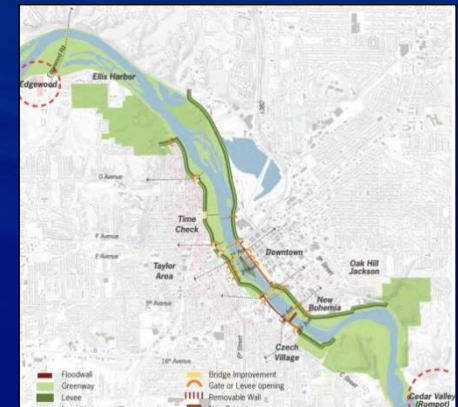
Recovery and Reinvestment Plan

Step 1. Form a Collaborative Planning Team

Individuals and Families → Neighborhoods → Communities → State → Region → Nation

↓

Representation of All Interests

Public

- Elected Officials
- Local Government
- Community Members

Private

- Business and Services
  - Banking, Health care
  - Utilities
  - Media
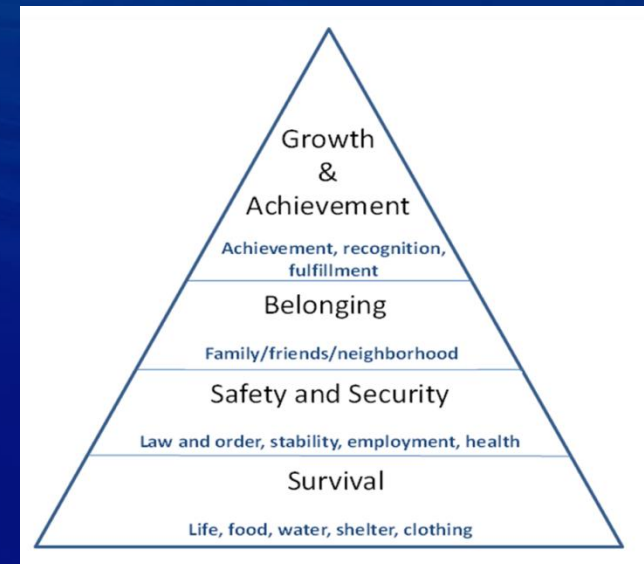- Organizations
  - NGOs (VOAD, Relief)

Step 2. Understand the Situation

Characterize the Social Dimensions

- Community members
  - Present and future needs
  - Demographics and economic indicators
  - Social Capital/Social Vulnerabilities
- Social institutions
  - Social functions
  - Gaps in capacity
  - Dependencies on other institutions
- Community metrics
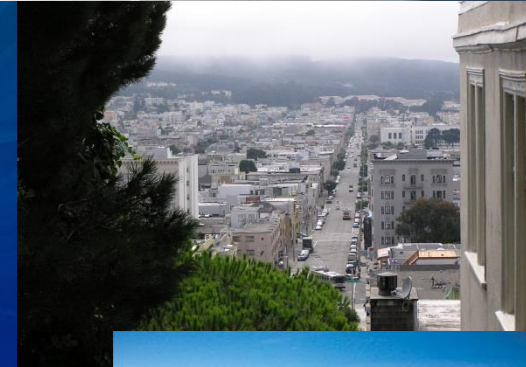
Characterize the Built Environment

Buildings

Individual structures, including equipment and contents that house people and support social institutions

Building Clusters

A set of buildings that serve a common function such as housing, healthcare, retail, etc.

Infrastructure Systems

Physical networks and structures that support social institutions, including transportation, energy, communications, water and waste water systems.

Dependencies

Internal and External, Time, Space, Source

Characterize

Location, number, construction, demands and use, etc.

Link Social Dimensions and Built Environment

Some rely more on the built environment

Emergency Rooms

Industrial Plants

Some functions change

Schools → **Shelters**

Identify how services are supported

- Services provided to meet needs

- Dependency on other services and systems

- Dependency on built environment

- Consequences of loss

Step 3. Determine Goals and Objectives

Establish Long Term Community Goals

- Long term goals to improve the community can guide the prioritization and implementation process.
  - Improve reliability of infrastructure systems
  - Enhance community functions
  - Reduce travel time impacts to residents and businesses
  - Revitalize an existing blighted area
- Community resilience is achieved over time
  - Resilience can be achieved with resources for current maintenance and capital improvements

Establish Desired Performance Goals for the Built Environment

- Performance goals are independent of hazard events.

  - Community functions are needed during recovery, such as acute health care, 911 call centers, emergency response

  - Consider role of a facility or system that impacts others outside the community.

- Define goals in terms of '*time needed to restore functionality*'.

- Use goals to help prioritize repair and reconstruction efforts.

- Goals may suggests criteria for new construction and retrofit of existing construction.

Recovery of the Built Environment

Organize around restoring functionality over time
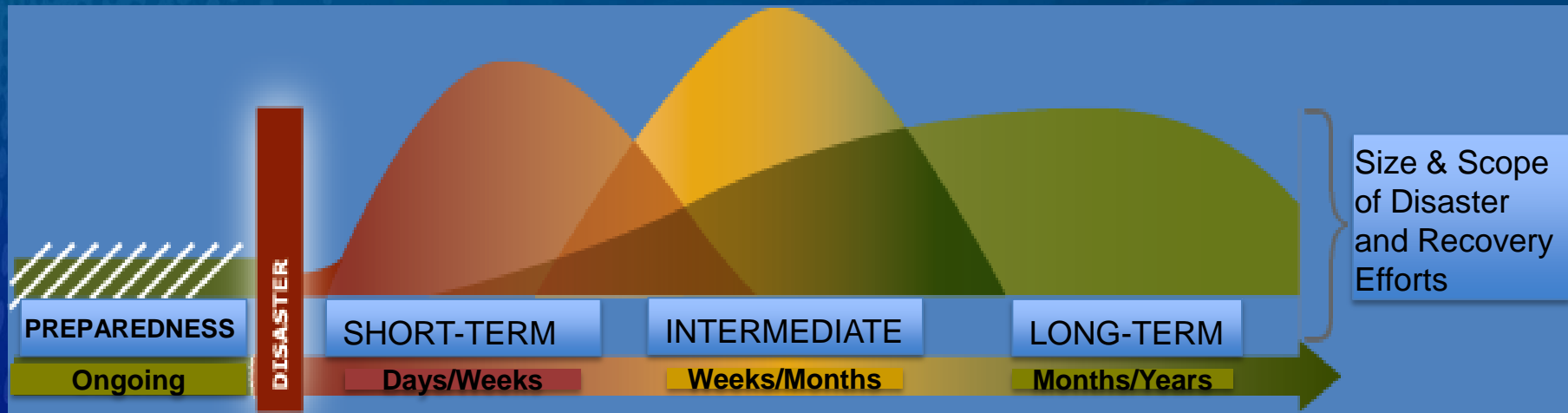
When is each system needed for recovery?

Determine and Characterize Hazards

- Identify prevalent hazards
  - Wind, Earthquake, Inundation
  - Fire, Snow, Rain
  - Human-caused or Technological

- Evaluate 3 hazard levels
  - Routine   Level expected to occur frequently
  - Expected   Level used to design buildings
  - Extreme   Maximum considered possible

Anticipated Performance of Existing Built Environment

- Anticipated performance (restoration of function) during recovery depends

  - Damage level - Condition and capacity of structural and nonstructural systems

  - Recovery time - Materials, equipment, and labor needed for restoration

  - Dependencies on other systems that may be damaged

Hurricane Irene

Hurricane Katrina

Example Summary Resilience Matrix

Superstorm Sandy

Step 4. Plan Development
Evaluate Gaps and Identify Solutions

- Prioritize gaps
  - Long-term community goals
  - Social needs during recovery

- Identify alternative solutions
  - Multiple stages
  - Temporary and permanent
  - Administrative
  - Construction

- Flood plain management
  - Reduce threat: relocate, elevate
- Wind and seismic preparedness
  - Strengthen: retrofit, redundancy
- Recovery Plans
  - Mutual aid agreements
  - Improvement plans

Infrastructure	Recovery Time								
	Days 0	Days 1	Days 1-3	Wks 1-4	Wks 4-8	Wks 8-12	Mos 4	Mos 4-24	Mos 24+
Critical Facilities									
Buildings	90%								
Transportation		90%							
Energy		90%							
Water									
Wastewater									
Communication		90%							

Prioritize Solutions and Develop Implementation Strategy

2013 Mandatory Soft Story Retrofit program for all older, wood-framed, multi-family buildings ensures the safety and resilience of San Francisco.

- Select solutions for prioritized performance gaps
  - Determine how alternative solutions can be combined to meet community goals.
  - Consider collaborative projects.

- Develop implementation strategies
  - Quantify benefits of impact on public safety and social needs.
  - Evaluate economic impacts on community - costs and savings.
  - Consider short- and long-term benefits versus costs.

- Determine preferred implementation strategy

North Texas 2050 plan integrates land use, natural resources, transportation, housing, water and wastewater infrastructure, parks and open spaces.

Step 5. Plan Preparation, Review, and Approval

Plan Approval

- Document proposed implementation strategy and supporting assessments and solutions.

- Share with all stakeholders and community members
  - Public Meetings, review and comment period.

- Finalize and approve community plan.

APPROVED

Final Community Plan: Implementation Strategy

Step 6. Plan Implementation and Maintenance

Implementation

- Formally adopt community plan to guide local government and agencies

- Identify and obtain resources to implement solutions

- Track and *communicate progress* to stakeholders

Plan Maintenance

- Review strategy and solutions on a regular basis

- Modify or update as needed

Guide Outline

Volume 1 - Methodology

Executive Summary

Ch 1. Introduction

Ch 2-6. Methodology and Planning Steps

Ch 7. Future Directions

Appendix: Planning Example – Riverbend, USA

Volume 2 - Reference

Executive Summary

Ch 9. Social Community

Ch 10. Dependencies and Cascading Effects

Ch 11. Buildings

Ch 12. Transportation Systems

Ch 13. Energy Systems

Ch 14. Communications Systems

Ch 15. Water & Wastewater Systems

Ch. 16 Community Resilience Metrics

Next Steps

- **Public Comment and Version 1.0**
  - Public comments encouraged through June 26.
  - Update Guide based on comments with planned release in September 2015

- **Disaster Resilience Panel**
  - Focus on identifying gaps in practice and knowledge
  - Develop supporting guidance and best practices to help users of the Guide.
  - First meeting planned for Fall 2015

- **Support Use of the Guide**
  - How to best work with communities interested in using the Guide?
  - Gather feedback to support revisions to Guide

NIST Contact

Website:

http://www.nist.gov/el/building_materials/resilience/

Guide:

http://www.nist.gov/el/building_materials/resilience/guide.cfm

Or google "NIST Resilience Planning Guide"

General E-mail: resilience@nist.gov

Questions?